

AMENDMENTS TO THE DRAWINGS:

Please amend the drawings as contained in the replacement sheets containing Figures 1 and 2 attached herein. No new matter has been added to the specification through the submission of these replacement drawings.

REMARKS

I. Introduction

Claims 9 and 10 are pending in the present application. Applicants respectfully submit that claims 9 and 10 are allowable for the following reasons.

II. Objection to the Drawings

The Office Action alleges that the “subject matter of the application admits of illustration by a drawing” to facilitate understanding of the invention. The Office Action submits that a “thimble insert assembly” should be illustrated. The Office Action further states that the drawings should show that the shaft “14” is split in the location of the dimple area to allow the tendon to deflect into the dimple area.

Applicants respectfully submit that as provided in the specification, the thimble insert assembly (defined as a control component, BPRA, WABA, or plug) is understandable by a person of ordinary skill in the art. In order to further prosecution, however, applicants respectfully submit replacement Figure 1 showing the thimble insert assembly (designated as reference element 1). Applicants furthermore respectfully submit that the shaft “14” is split as designated in Figure 1 by the removed areas of material next to the location of the tendon 20. Applicants respectfully submit that Figure 1 illustrates this feature and as such Applicants respectfully request withdrawal of the objection to the drawings.

The Office Action further alleges that reference character 72 has been used to designate both the shaft both internal and external to guide thimble 50. The Office Action further alleges that reference elements 64 and 36 are not described in the application.

Applicants respectfully submit that reference character 72 is recited in the specification as a shaft 72. See original specification page 5, lines 23 to 23. Applicants have amended Figure 2 to recite a single reference element shaft 72. Applicants have further amended the drawings to remove reference elements 64 and 36. Applicants respectfully request withdrawal of this objection to the drawings.

III. Objection to the Specification

The Office Action objects to the specification as the terms “lapped” and “deflect” are misspelled and that numerical designators should more clearly identify figure elements.

Applicants have amended the specification to correctly recite the terms lapped and deflect as well as more clearly identify figure elements. Applicants have furthermore provided a replacement abstract. Applicants respectfully request withdrawal of the objections to the specification.

IV. Objection to the Specification Under 35 U.S.C. § 112, First Paragraph

The Office Action objects to the specification under 35 U.S.C. § 112, first paragraph as allegedly failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure. The Office Action alleges that is notoriously well known in the art that thimble inserts are subjected to substantial vibration and wear, as taught by United States Patent 4,902,468. It is alleged that the specification provides no description regarding the prevention of wear so as to enable the repair sleeve to be used without wear becoming a factor precluding the use of the sleeve. The Office Action further alleges that the specification fails to disclose how and in what manner contact of the sleeve with a thimble insert assembly precludes movement of control rods.

Applicants respectfully submit that as provided on page 1, lines 1 to 5, the present invention relates to a repair of a nuclear fuel assembly to aid in lifting the fuel assembly during outages. Applicants respectfully submit that the alleged “substantial vibration” during use of the repair sleeve during lifting, is non-existent (i.e. the reactor is shut down). The placement of a thimble insert assembly allows the repair sleeve to be utilized for structural load lift, and therefore examples of thimble insert assemblies are provided. A person of skill in the art would recognize applicable thimble insert assemblies which may be inserted into a guide tube to accomplish a lift.

Applicants further submit that as provided in the specification on page 6, line 31 to page 7, line 13, the repair sleeve 10 is inserted into the guide thimble opening in the top nozzle of a nuclear fuel assembly. As illustrated, the dimples 16 on the tendons 20 are wider than the interior diameter of the guide thimble tube,

therefore the tendons 20 bend in when inserted into the guide thimble opening. When the dimples 16 reach the dimple area 34, the dimples 16 then project into the dimple area 34 as illustrated.

Applicants further submit that the shaft 14 has openings 28 which are areas of removed material as indicated in Figures 1 and 2. The tendons 20 project through these open areas as described in the specification on page 5, line 1 to line 11. The specification does not include any suggestion that the tendons are placed into the sleeve at a later time. As illustrated, the shaft 14 is a single piece of material with openings 28 created by the removal of material from the shaft 14 with tendons 20 running through the areas of the shaft which do not have openings. The shaft is split into separate sections (the tendons) by the openings in the shaft of material.

The Office Action further alleges that there is no adequate description as to how the repair sleeve is prevented from deflection in the horizontal direction. Applicants respectfully traverse this rejection. As provided on page 7, lines 7 to 13, the thimble insert assembly prevents the dimples from exiting the dimple area 34 through plastic deformation of the sleeve (i.e. the placement of the thimble insert does not allow the tendons to bend due to contact between the insert assembly and the tendon 20.)

Applicants respectfully request withdrawal of the objections provided in the Office Action.

V. Rejection of Claims 9 and 10 Under 35 U.S.C. § 112, Second Paragraph

Claims 9 and 10 were rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite or failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action alleges that claim 9, line 8 recites the limitation of "a dimple of a guide thimble" and that there is insufficient antecedent basis for this limitation in the claim. The Office Action further alleges that the limitation of "the dimples" in line 10 is improper as there is not proper antecedent basis for the limitation.

Applicants respectfully traverse the rejections above. The feature of "a dimple of a guide thimble" is a first recitation of such a feature and therefore the recitation of "a" dimple is in conformance with 35 U.S.C. 112, second paragraph. Applicants further submit that claim 9 recites the feature of at least two tendons extending through the openings, the tendons configured to deflect in an instance of a

horizontal load on the tendon, the tendons having a dimple configured to be inserted into a dimple of a guide thimble sleeve. As a consequence, there are at least two recited dimples. The recitation of "the dimples" in line 10 is proper as this is the second recitation of these individual components. Although not agreed with as a person of skill in the art would be able to understand the claim, applicants have amended claim 9 to recite a nuclear fuel assembly. Applicants furthermore traverse the Office Action rejection related to the use of the word "extended" relating to tendons protruding through openings. Applicants respectfully submit that Webster's II New College Dictionary defines the word "extended" as to "reach", therefore the extended tendons reach through the opening. Applicants have used the word "extended" in a manner consistent with the definition and request withdrawal of the rejection.

As requested by the Examiner, applicants have amended claim 9 to recite that the tendons are configured to deflect in an instance of a horizontal load on the tendon during insertion, the tendons having a dimple configured to be inserted into a dimple of a guide thimble sleeve. Through the amendment to claim 9, the claim 10 feature reciting the step of inserting the thimble insert assembly into the interior of the repair sleeve prevents further deflection of the repair sleeve in a horizontal direction is consistent with 35 U.S.C. 112, second paragraph as a first deflection occurs during installation of the repair sleeve and further defections are prevented by this method step.

The Office Action further rejects the claims as the term "tendon" is alleged to be only applicable a "wire or cable used in the manufacture of concrete nuclear reactor containment buildings to prestress concrete". The Office Action states that the word "tendon" should be redefined.

Applicants respectfully traverse this rejection. Applicants respectfully submit that as known in the art, a tendon is a piece of material which connects two different points in a structural manner. Applicants have used this known definition accordingly. Applicants respectfully direct the attention to a typical website <http://www.s3i.co.uk/tiebarandfork.php> which clearly shows that tendons are not only used to prestress concrete, but in fact are used to translate forces from one point to another. As a result, applicants have used the term in a manner consistent with the industry. Applicants respectfully request withdrawal of the rejection to the claims for the use of the word "tendon". Applicants have amended the specification

and claims to recite a “projection” instead of a “dimple” as well as deleted the term “snugly” as suggested by the examiner. Applicants respectfully request withdrawal of the rejections of claims 9 and 10.

VI. Rejection of Claims 9 and 10 Under 35 U.S.C. §102(b) & 35 U.S.C. §103(a)

Claims 9 and 10 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 4,684,498 (“Paul”) alone or, in the alternative, under 35 U.S.C. §103(a) as obvious over Paul in view of Merriam Webster’s Collegiate Dictionary Tenth Edition.

Amended claim 9 recites the features of a method to repair a nuclear fuel assembly. Claim 9 recites the specific method steps of providing a repair sleeve, the repair sleeve having a shaft with a first end, a second end and a diameter, the diameter configured to fit into a guide thimble opening of a top nozzle of the fuel assembly, wherein the diameter of the shaft is dimensioned such that an exterior of the shaft fits into the guide thimble opening, wherein the shaft has at least two openings, and at least two tendons extending through the openings, the tendons configured to deflect in an instance of a horizontal load on the tendon during insertion, the tendons having a projection configured to be inserted into a dimple of a guide thimble sleeve and the repair sleeve having a lapped edge for installation on the top of the top nozzle of the nuclear fuel assembly; and inserting the repair sleeve in the guide thimble opening in the top nozzle of the nuclear fuel assembly such that the projections of the tendons project into the dimples of the guide thimble sleeve; and inserting a thimble insert assembly into an interior of the repair sleeve. Amendments to claim 9 are found, for example in Figure 2 of the originally filed application.

Paul allegedly relates to a guide thimble captured locking tube in a reconstitutable fuel assembly. Paul provides a top nozzle attaching structure 46 which is placed within a top nozzle of a nuclear fuel assembly. As illustrated in Figure 5, the structure 46 is placed internally to a fuel assembly and does not provide lapped edge as required in amended claim 9. Paul, in fact, always requires that an adapter plate and a guide thimble upper end portion are maintained in a locking arrangement, precluding the positioning of a repair sleeve as presented in the claims of the present invention. Paul does not disclose or even suggest any configuration relating to a repair sleeve as described in claim 9. The addition of

Merriam Webster's Collegiate Dictionary, Tenth Edition definition of the term "dimple" does not cure the defects of the Paul reference. Merriam Webster's Collegiate Dictionary, Tenth Edition is merely used by the Office Action to define a dimple and does not disclose or suggest any configuration which has a repair sleeve with a lapped edge. As a result of the combination of references failing to disclose or suggest the features of claim 9, applicants respectfully request withdrawal of the rejection to claim 9.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990).

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

Claim 10 depends from claim 9 and therefore includes all the features of amended claim 9. Applicants respectfully submit that claim 10 is patentable for at least the reasons provided above in relation to amended claim 9. Applicants respectfully request withdrawal of the rejections to claim 9 and 10.

III. **Conclusion**

It is respectfully submitted that all pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,
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